UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,300	09/29/2003	Edward George Butt	TUC920030156US1	4105

7590 09/28/2006

Keith A. Bates
IBM Corporation
90A/9032-1
9000 S. Rita Road
Tucson, AZ 85744

EXAMINER	
VU, TUAN A	

ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/674,300	BUTT ET AL.	
	Examiner	Art Unit	
	Tuan A. Vu	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 9/29/06.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 9/29/06 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 9/29/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to the application filed 9/29/2003.

Claims 1-20 have been submitted for examination.

Specification

2. The disclosure is objected to because of the following informalities: The reference mentioned in page 1, 8 concerning a related Application, needs to be adjusted so that this be identified as a copending Patent Application currently having Serial Number 10674295.

Appropriate correction is required.

Claim Objections

3. Claims 1, 5, 9, 12, 15, and 18 are objected to because of the following informalities: The acronym 'LIC' being introduced has to be spelled out at least once.

4. Claims 5, 12, and 18 exhibit a typographical error in 'contoller' (li. 9; li. 15; li. 15, respectively) and this term should be *controller*.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 9-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Specifically, claim 9 recites a system for updating LIC comprising 2 clusters with communication line in-between, an action table having state actions, and an automated dispatcher for executing the above state actions to perform installing software and verifying

firmware. The only hardware parts of the system thus recited appear to be the 2 clusters, and the result of having action performed so that the cluster would have firmware or software updated is construed in light of the dispatcher executing some table state actions. The Specifications shows the state actions being software table; and the dispatcher being computer instructions (Specs, pg. 5, pg. 11 and related Figures); that is, confirming that these entities are mere software-implemented components/entities. Accordingly, the claim as a whole, amounts to a system being based on 2 software entities interacting in a software process for updating some hardware storage, but absent any hardware to realize such functionality, no *update* result would be conveyed. Software functional elements being recited without reasonably teaching that they are embodied or stored in computer medium or tangible hardware executing support would amount to descriptive functional elements leading to non-statutory subject matter.

> The Federal Circuit has recently applied the practical application test in determining whether the claimed subject matter is statutory under 35 U.S.C. § 101. The practical application test requires that a " useful, concrete, and tangible result" be accomplished. An "abstract idea" when practically applied is eligible for a patent. As a consequence, an invention, which is eligible for patenting under 35 U.S.C. § 101, is in the "useful arts" when it is a machine, manufacture, process or composition of matter, which produces a concrete, tangible, and useful result. The test for practical application is thus to determine whether the claimed invention produces a "useful, concrete and tangible result".

The claim amounts to lack of teaching that some concrete action is taking place via tangible hardware support; thus fails to produce a concrete, tangible and useful result; hence is rejected for leading to a non-statutory subject matter.

Dependent claims 10-11 for failing to provide any hardware support for the descriptive software functionality, are also rejected.

Claim 12 recites a system having 2 storage clusters with a communication line, and the same software functionality as recited in claim 9; and is likewise rejected for failing to convey

that hardware support is in place for enabling the recited software functionality to be realized in terms of real world actions leading to tangible, concrete and useful result.

Claims 12-14 are likewise rejected for leading to a non-statutory subject matter.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2, 5-8, 10, 12-14, 16, 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites steps C and D (and steps H and I) as rebooting followed by updating the a second (or first) cluster in that order. From the Specifications, this is described as phase 1 (Specifications -pg. 6, 2nd para; Fig. 3: Cluster 1, 210: *Update firmware on cluster 2* → Cluster 2, 210: *Hard drive reboot, Firmware updated*) such that there is inconsistency or no clear teaching between this sequence of rebooting then updating. That is, the updating is not disclosed as a true updating step after a reboot step, but appears merely as establishing updated data (see Fig. 3, Cluster 2, 210: *Firmware updated* ; OR Cluster 1, 220: *Firmware updated*) as a result of a reboot in Cluster 2 or of Cluster 1, i.e. there is no such actual step of updating any data after the reboot step subsequent to the *quiescing* step. The sequence of 'quiescing, rebooting and resuming' has been consistent in the Disclosure (pg. 6; Table 1) -- as not including a *update* step after a reboot step -- making it unclear for one skill in the art as to what exactly the recited updating step (step D or step I, claim 2) after a reboot amounts to. The lack of clear teaching as exhibited from reading the Specifications in light of inconsistency in use of terminology like *updating* and

updated has rendered this limitation unclear; and one skill in the art would treat this updating step as just establishing that data after a reboot has been reconfigured and correct.

Claim 5 recites step H and I which amount to the same deficiency as set forth above in light of the indefinite teaching from the Specifications; thence these 2 steps will be treated as establishing confirming updated data as a result of rebooting. Based on the sequence described as 'quiescing, rebooting and resuming' from the Specifications and the teaching from Fig. 4 wherein after a reboot (Fig. 4, cluster 2, 420: *Firmware updated*), only 'Firmware updated' is disclosed, rendering indefinite as to what exactly this true updating action/step comprises of; that is, in light of lack of teaching from pg. 12, second paragraph, it is recognized that the updating (of firmware) has been accomplished prior to the reboot so that only some reconfiguration is to be checked as a result of such restart or ILP. Hence, step H or I in claim 5 would be treated as though this is merely a check(verification) after a reboot; and that the actual updating of the firmware has been over.

Claims 6-8 are rejected for not remedying to the base claims.

Claim 10 (steps D and I) is rejected based on the deficiencies as set forth in claim 2.

Claim 12 (steps H and I) is rejected based on the rationale as set forth in claim 5, so that claims 13-14 are also rejected for not remedying to claim 12.

Claim 16 is rejected for having the deficiency of claim 2 or claim 10.

Claim 18-20 are rejected for the deficiency similar in claims 5-8.

Claims 2, 5, 10, 12, 16, and 18 recite rebooting after an updating step (e.g. cl. 2: steps E, J; cl. 5: steps J, K; cl. 10: steps E, J; cl. 12: steps J, K; cl. 16: steps E, J; cl. 18: steps J, K). From the Specifications, Fig. 3 or 4, this step is disclosed (i) as optional (stage 220, 420: *if necessary*)

and (ii) as *may or may not necessary*, from pg. 12, 2nd paragraph. There is insufficiency in the disclosure as to this step being 100% necessary while any claim reciting this step does not appear to teach this step as being an optional limitation; hence it is unclear as to whether this specific *reboot* step punctuates the *metes and bounds* of this updating process, when the disclosure fails to provide a sturdy requirement that a rebooting step will take place every time in the recited sequences from the above claims. This rebooting step will be treated as a non-required step.

Claims 6-8, 13-14 and 18-20 are also rejected for not remedying to the above lack of teaching.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. Claims 1, 3-4, 9, 15,17 are rejected under 35 U.S.C. 102(a) as being anticipated by SGI TPL, 'SGI Total Performance 9100 (2Gb TP9100) Storage System User's Guide', 09-27-2003 (hereinafter SGI_TP).

As per claim 1, SGI_TP discloses a method for performing a concurrent automated LIC update on a storage controller, comprising the steps of:

installing LIC update software on a first cluster and a second cluster (see Chap. 3: pg. 3, top; Chap. 1: pg. 2, Rolling Upgrade Capability: Note – Note: controller firmware version upgraded with COD to all disk drives reads on LIC software installed on first and second cluster; while firmware and Version release update discloses LIC update);

continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster (Chap. 1: pg. 2, Rolling Upgrade Capability); verifying said first cluster firmware on said first cluster; and verifying said second cluster firmware on said second cluster (e.g. *desired version* – Chap. 1, pg. 3 top; *validity of any configuration* - Chap. 3: pg. 3, top).

As per claim 3, SGI_TP discloses installing said LIC update software on a backup drive on said first cluster; and (B.) installing said LIC update software on a backup drive on said second cluster(Chap 4, pg. 5: Cache and availability, Table 4-4, Mirrored drive).

As per claim 4, SGI_TP discloses running an automated LIC dispatcher process that calls state actions from a state action table, wherein said state action table comprises a plurality of individual state actions to perform said concurrent automated LIC update (chap. 4: *Drive state ...array management software*, pg. 9-10).

As per claim 9, SGI_TP discloses a system for automatically updating LIC on a storage controller, comprising:

a first cluster; a second cluster; a communication line between said first cluster and said second cluster (see chap. 1: Overview);

a state action table, wherein said state action table comprises a plurality of individual state actions for a concurrent automated LIC update; an automated LIC dispatcher executing (refer to claim 4 – Note: Array Management software reads on dispatcher, see Chap. 4: Drive State Reporting, pg. 9) said state actions from said state action table to perform method steps comprising:

(A.) installing LIC update software on said first cluster and said second cluster; (B.) continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster; (C.) verifying said first cluster firmware on said first cluster; and (D.) verifying said second cluster firmware on said second cluster;

all of which limitations having been addressed in claim 1.

As per claim 15, SGI_TP discloses a article of manufacture comprising a data storage medium tangibly embodying a program of machine-readable instructions executable by a digital processing apparatus to perform method steps for automatically updating LIC on a storage controller, comprising:

a first cluster; a second cluster; a communication line between said first cluster and said second cluster (see chap. 1: Overview);

a state action table, wherein said state action table comprises a plurality of individual state actions for a concurrent automated LIC update; an automated LIC dispatcher executing (refer to claim 4 – Note: Array Management software reads on dispatcher, see Chap. 4: Drive State Reporting, pg. 9) said state actions from said state action table to perform method steps comprising:

(A.) installing LIC update software on said first cluster and said second cluster; (B.) continuing operation of said storage controller with at least one of said first cluster and said second cluster while updating a first cluster firmware on said first cluster and updating a second cluster firmware on said second cluster; (C.) verifying said first cluster firmware on said first cluster; and (D.) verifying said second cluster firmware on said second cluster;

all of which limitations having been addressed in claim 1.

As per claim 17, refer to claim 3.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 2, 5-8, 10-14, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over SGI TPL, 'SGI Total Performance 9100 (2Gb TP9100) Storage System User's Guide', 09-27-2003; and further in view of Shirasawa et al., USPN: 7,032,218 (hereinafter Shirasawa).

As per claim 2, SGI_TP discloses wherein step B further comprises the steps of:

(B) transferring operation control of said storage controller to said first cluster; (D) updating said second cluster firmware on said second cluster and (E) rebooting it; (F) transferring operation control of said storage controller to said second cluster; (I) updating said first cluster firmware on said first cluster and (J) rebooting it; and (K) transferring operation control of said storage controller to said first cluster and said second cluster (see Chap. 1: Rolling Upgrade Capability, pg. 2).

SGI_TP does not explicitly disclose:

(A, C) quiescing of second cluster prior to control transfer and rebooting of second cluster before updating; (G, H) quiescing first cluster and rebooting first cluster before updating first cluster.

The desirability to maintain stable power when a drive or a cluster is subject to update of configuration is shown in SGI_TP along with SGI_TP teaching checking if after a power is recycled if any configuration is proper (see Chap. 1, pg. 3, top; Chap. 3, pg. 3: **Caution** sections) suggests improper configuration data can be due to advent of unstable power; thus reconfiguring a cluster require a need a steady power situation via power reboot, or disabling its activity state prior to switching control or reconfiguring. Analogous with SGI_TP's RAID updating endeavor, Shirasawa teaches disabling of I/O process and reboot a unit prior to its updating of latest firmware (e.g. step 115, 135, Fig. 3). It would have been obvious for one skill in the art at the time the invention was made to stop I/O process (quiesce) and reboot the updated cluster prior to rechecking on the latest state of the updated firmware as shown by Shirasawa and apply these steps prior to the update as purported by SGI_TP. One would be motivated to do so that to not incur unstable fluctuation while data is being updated, and to enable changes in the updated firmware to better take effect or verified in a later power steady state as endeavored by SGI_TP in light of a desire to establish rebooted power, and the subsequent verifying of update data as presented by Shirasawa (see above) or SGI_TP (Chap. 3, pg. 3).

As per claim 5, SGI_TP discloses method for performing a nonconcurrent automated LIC update on a storage controller, comprising the steps of:

(A) installing LIC update software on a first cluster and a second cluster (see Chap. 3: pg. 3, top; Chap. 1: pg. 2, Rolling Upgrade Capability: Note – Note: controller firmware version upgraded with COD to all disk drives reads on LIC software installed on first and second cluster);

(B) suspending operation of said storage controller; (G) transferring LIC update process control of said storage controller to said first cluster (Chap. 1: Rolling Upgrade Capability, pg. 2);

(H) updating a first cluster firmware on said first cluster; (I) updating a second cluster firmware on said second cluster (chap. 3: *tests ... validity* - pg. 3, top) ;

(J) rebooting said first cluster; (K) rebooting said second cluster; and (L) transferring operation control of said storage controller to said first cluster and said second cluster (e.g. *restarted* - Chap. 1: Rolling Upgrade Capability, pg. 2).

But SGI_TP does not disclose steps

(C) quiescing said first cluster;

(D) quiescing said second cluster;

(E) rebooting said first cluster;

(F) rebooting said second cluster; prior to step steps G and H. But rebooting (steps E, F) subsequent to stopping of I/O activities (steps C, D) in a RAID drive for the purpose of its upgrading has been addressed as obvious in light of the rationale as set forth in claim 2 using Shirasawa's teaching.

As per claim 6, refer to SGI_TP (e.g. *desired version* – Chap. 1, pg. 3 top; *validity of anyconfiguration* - Chap. 3: pg. 3, top) for verifying said first cluster firmware on said first cluster; and verifying said second cluster firmware on said second cluster.

As per claims 7-8, refer to rationale of claims 3-4, respectively.

As per claim 10, in reference to claim 9, this claim corresponds to the subject matter of claim 2; hence will incorporate the respective rationale of rejection as set forth therein.

As per claim 11, refer to the rejection set forth in claim 3.

As per claim 12, SGI_TP discloses a system for automatically updating LIC on a storage controller, comprising: a first cluster; a second cluster; a communication line between said first cluster and said second cluster; a state action table (Note: this is the subject matter recited on top of claim 9; for which refer to corresponding rejection as set forth in claim 9), wherein said state action table comprises a plurality of individual state actions for a nonconcurrent automated LIC update;

an automated LIC dispatcher executing state actions from said state action table to perform method steps comprising: (A.) installing LIC update software on said first cluster and said second cluster; (B.) suspending operation of said storage controller; (C.) quiescing said first cluster; (D.) quiescing said second cluster; (E.) rebooting said first cluster; (F.) rebooting said second cluster; (G.) transferring LIC update process control of said storage contoller to said first cluster; (H.) updating a first cluster firmware on said first cluster; (I.) updating a second cluster firmware on said second cluster; (J.) rebooting said first cluster; (K.) rebooting said second cluster; and (L.) transferring operation control of said storage controller to said first cluster and said second cluster;

all of which (nonconcurrent update) limitations having been addressed as obvious in claim 5 above.

As per claims 13-14, refer to claims 6-7.

As per claim 16, SGI_TP (in view of Shirasawa) discloses (by virtue of obvious teaching) wherein step B further comprises the steps of: (A.) quiescing said second cluster; (B.) transferring operation control of said storage controller to said first cluster; (C.) rebooting said

second cluster; (D.) updating said second cluster firmware on said second cluster; (E.) rebooting said second cluster; (F.) transferring operation control of said storage controller to said second cluster; (G.) quiescing said first cluster; (H.) rebooting said first cluster; (I.) updating said first cluster firmware on said first cluster; (J.) rebooting said first cluster; and (K.) transferring operation control of said storage controller to said first cluster and said second cluster; all of which limitations having addressed in the rationale as set forth in claim 2.

As per claim 18, this claim is the computer readable medium version of claim 12; hence is rejected using the rationale of claim 12.

As per claims 19-20, refer to corresponding rejections of claims 13-14.

Conclusion

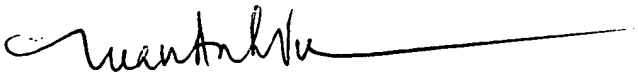
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)272-3719.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 (for non-official correspondence - please consult Examiner before using) or 571-273-8300 (for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tuan A Vu
Patent Examiner,
Art Unit 2193
September 15, 2006